

REMARKS

Reconsideration of the above-identified patent application in view of the amendments above and the remarks following is respectfully requested.

Claims 1-12 are in this case. Claims 1 and 2 have been rejected under § 102(b). Claims 2-5 and 12 have been rejected under § 103(a). Claims 6-11 have been objected to. Independent claim 3 has been amended. New claims 13-24 have been added.

The claims before the Examiner are directed toward methods by which a base station, to which a mobile unit could be handed off from another base station presently in communication with the mobile unit, detects the presence of the mobile unit, with no or minimal participation by the mobile unit. According to one method, the base stations use a time-division scheme such as frequency hopping to communicate with the mobile unit. The base station that is initially communicating with the mobile unit periodically yields a hop to allow neighboring base stations to communicate with the mobile unit so as to detect the mobile unit. According to the other method, either the base station currently communicating with the mobile unit or one of the neighboring base stations issues a PING command to the mobile unit. The neighboring base stations receive an ECHO reply from the mobile unit.

Objections to the Drawings

The Examiner has objected to the drawings because the lack of uniformity in the sizes of the labels is so severe that some of the labels are too tiny to read. The Examiner gave only examples (Figures 6 and 7) of drawings that suffer from this defect. Applicant presumes that the drawings that suffer from this defect are Figures 5, 6, 7, 13, 16A and 23.

Attached please find replacements of these drawings that have larger labels. Figure 5 has been replaced with Figures 5A, 5B, 5C and 5D. Figure 6 has been replaced with Figures 6A and 6B. Figure 7 has been replaced with Figures 7A, 7B and 7C. Figure 13 has been replaced with Figures 13A and 13B. Figure 16A has been replaced with new Figures 16A and 16B. The original Figure 16B has been changed to Figure 16C. A copy of Figure 16C is attached with the changes indicated in red. Figure 23 has been replaced with Figures 23A and 23B. The specification has been amended accordingly.

The Examiner has objected to Figure 1 as lacking an indication that it illustrates prior art. Attached please find a replacement Figure 1 with the legend "PRIOR ART" added in red.

§ 102(b) Rejections – Farwell et al. '354

The Examiner has rejected claims 1 and 2 under § 102(b) as being anticipated by Farwell et al., EP Patent Application No. 0 594 354 A2 (henceforth, "Farwell et al. '354"). As best understood, the Examiner intended to reject only claim 1 as anticipated by Farwell et al. '354, because no arguments are presented for a rejection of claim 2 as anticipated by Farwell et al. '354. The Examiner's rejection is respectfully traversed.

Farwell et al. '354 teach a method of handing off a mobile unit 105 from a base station 104 to a base station 103 or 102 in a system in which the base stations communicate with mobile unit 105 using frequency hopping. When the strength of the signal that base station 104 receives from mobile unit 105 falls below a threshold, base station 104 sends a start handoff message to mobile unit 105 and notifies the other base units, via a system controller and switch 101, that a possible handoff has commenced. Mobile unit 105 starts repeatedly broadcasting a synchronization

pattern. System controller and switch 101 determines which base station is receiving the strongest signal from mobile unit 105 and instructs that base station to take over communication with mobile unit 105. Whichever base station takes over communication with mobile unit 105 sends mobile unit 105 a stop handoff message. In response to the stop handoff message, mobile unit 105 stops broadcasting the synchronization pattern.

A first crucial difference between the present invention as recited in claim 1 and the teachings of Farwell et al. '354 is that base station 104 of Farwell et al. '354 never yields a hop. The frequency hopping method used by Farwell et al. '354 is described in column 3 lines 36-46 as follows:

During an active call, voice information is transmitted by repeatedly sequencing through the set (commonly referred to as frequency hopping) with two-way voice transmission occurring for 5 milliseconds in each channel. This type of transmission is disclosed in greater detail in the U.S. Patent Application M. E. Gillis, et al. "A Cordless Telephone Arranged for Operation in a Frequency Hopping System, Case No. 1-6-2-1, filed October 21, 1991, Serial No. 07/779754 and assigned to the same assignee as the present application.

US 07/779754 has issued as US Patent No. 5,353,341. A copy of this patent is attached for the convenience of the Examiner. The frequency hopping method used by Farwell et al. '354 is described in more detail in column 6 lines 43-58 of US 5,353,341 as follows:

Communications between the base unit and the handset unit occur in time periods designated as transmission frames. In a frame, the base unit and the handset unit both transmit to each other. A typical transmission frame may be, for example, 5 milliseconds in length and contain time slots for approximately 500 bits of information. In operation, the base unit generally transmits in the first half of each frame or for 2.5 milliseconds and is then reconfigured to receive a signal from the handset unit which transmits in the second half of each frame or for 2.5 milliseconds on the same frequency. The handset unit operates in complementary fashion to the base unit in that it receives in the first half of each frame and is reconfigured to transmit in the

second half of each frame. This cyclic frame transmission generates 80 frames in approximately 400 milliseconds.

So as best understood, as long as base station 104 and mobile unit 105 are communicating with each other, and until system controller and switch 101 instructs base station 104 to stop communicating with mobile unit 105, base station 104 transmits to mobile unit 105 in every time slot of every frame, and never skips a time slot. Note that the "time slots" of US 5,353,341 are equivalent to the "hops" of the present invention.

A second crucial difference between the present invention as recited in claim 1 and the teachings of Farwell et al. '354 is that neighboring base stations 102 and 103 do not communicate with mobile unit 105. Base stations 102 and 103 merely passively "monitor the signal strength from mobile unit 105 for a predetermined amount of time" (column 4 lines 31-33).

Thus, the present invention, as recited in claim 1, is not anticipated by Farwell et al. '354. Furthermore, the present invention, as recited in claim 1, is not even obvious from Farwell et al. '354. There is neither a hint nor a suggestion in Farwell et al. '354 of any utility to base station 104 skipping a transmission time slot, to facilitate handoff or for any other reason. There also is neither a hint nor a suggestion in Farwell et al. '354 of any need for base stations 102 and 103 communicating with mobile unit 105 while the system decides whether to hand off mobile unit 105 from base station 104.

Lest the Examiner construe the passive monitoring by base stations 102 and 103 of Farwell et al. '354 of signals from mobile unit 105 as "communicating with mobile unit 105", new claim 23 has been added. New claim 23 states explicitly that the communication, between the neighboring Base Station(s) and the mobile unit, that is recited in claim 1, includes transmissions from the neighboring Base Station(s) to

the mobile unit. Support for new claim 23 is found in the specification on page 46 lines 18-21:

According to the invention, once in a while the Base Station that is currently communicating with the handset will “give up”...a short transmission duration, during which one or more neighboring Base Stations may transmit to the handset. (emphasis added)

on page 46 line 29 through page 47 line 2:

Any of the neighboring Base Stations that are not close enough to each other may use the same hop to transmit to the handset. The neighboring Base Stations that are close to each other will use different hops to call (communicate with) the handset. (emphasis added)

on page 47 lines 20-23:

As shown in **Figure 14C**, three of the neighboring Base Stations 393, 395, 397 transmit on even-numbered skipped hops 705. As shown in **Figure 14D**, the other three of the neighboring Base Stations 392, 394, 396 transmit on odd-numbered skipped hops 707. (emphasis added)

and on page 48 lines 2-5:

According to the timing of the hops received with high energy (P_1), the Base Stations that wait for the call, can determine the times in which they are allowed to try to call the handset. In these times the Base Stations transmit to all handsets that are communicating with neighboring Base Stations. (emphasis added)

§ 103(b) Rejections – Farwell et al. ‘354 in view of Moldavsky et al. ‘463

The Examiner has rejected claim 2 under § 103(a) as being unpatentable over Farwell et al. ‘354 in view of Moldavsky et al., US Patent No. 5,115,463. The Examiner’s rejection is respectfully traversed.

It is demonstrated above that independent claim 1 is allowable in its present form. It follows that claim 2, that depends therefrom, also is allowable.

§ 103(b) Rejections – Farwell et al. '354 in view of Grounds et al. '381

The Examiner has rejected claims 3-5 and 12 under § 103(a) as being unpatentable over Farwell et al. '354 in view of Grounds et al., US Patent No. 6,510,381 (henceforth, "Grounds et al. '381"). The Examiner's rejection is respectfully traversed.

The teachings of Farwell et al. '354 are described above in the context of the § 102(b) rejections. Grounds et al. '381 apparently is cited only to show that the exchange of PING and ECHO messages is known in the prior art, so that base station 104 could initiate a handoff by sending a PING message instead of a start handoff message to mobile unit 105, and mobile unit 105 could respond by broadcasting an ECHO as a synchronization pattern. However, this combination of the teachings of the two references would be inoperative, for two reasons.

The first reason is that, as is well-known in the art, in packet-based communications systems generally, and in particular in the Internet that is advocated by Grounds et al. '381 column 5 line 53 as the preferred network 220, it is not possible to predict in advance when a transmitted packet will arrive at its destination. This makes it impossible to use the exchange of a PING and an ECHO for synchronization. *{Note to Michael Shergei: If the properties of PING/ECHO (like whether the time delay between them is predictable) are protocol-dependent, then we can't cite the Bluetooth protocol to show that the PING/ECHO of the Internet's TCP/IP protocol can't be used for synchronization. Because this is a first response, rather than look for an appropriate description of PING/ECHO in TCP/IP, I prefer to just assert it ("as is well-known in the art"). We can worry about documenting it if we need to substantiate it later, like in response to a final rejection or in an appeal. Similarly for one ECHO per PING.}*

The second reason is that, as is well-known in the art, the purpose of the PING-ECHO combination is for the device that sends the PING message to verify that the device that responds with an ECHO message is still communicating. For this purpose, a PING message invokes a single ECHO message. Now, as stated in Farwell et al. '354 column 4 lines 26-29,

Base stations 102 and 103...utilize the synchronization pattern in hopping channel 0 to come into synchronization with mobile unit 105.

To this end, mobile unit 105 needs to keep broadcasting the synchronization pattern until base stations 102 and 103 are synchronized with mobile unit 105. (Note that this is not necessary in the present invention because the base stations of the present invention synchronize to each other, as described in the specification on page 37 line 5 through page 38 line 21.) This is why the base station to which mobile unit 105 is handed off needs to send a stop handoff message to mobile unit 105; otherwise, mobile unit 105 would just keep on broadcasting the synchronization pattern. *{Note to Michael Shergei: I would like to leave this reason in even if it is a weaker reason than the first. It now is the subsidiary reason.}*

Claim 3 was intended to encompass two variants of the second method of the present invention. In the first variant, as illustrated in Figure 15A, with base station 123 initially in communication with mobile unit 121, neighboring base station 124 sends PING command 145 to mobile unit 121. In the second variant, as illustrated in Figure 15B, base station 123 sends PING command 147 to mobile unit 121. Claim 3 now has been amended to encompass only the first variant, in which at least one of the base stations that is waiting for the mobile unit to enter its coverage area sends the PING command to the mobile unit. This amendment renders claim 3 allowable over the combination of Farwell et al. '354 and Grounds et al. '381 cited by the Examiner whether or not that combination would be operative. In Farwell et al. '354, it is base

station 104 that is currently communicating with mobile unit 105 that initiates the handoff by sending a start handoff message to mobile unit 105. Base stations 102 and 103 are passive, and only monitor the strength of the signals from mobile unit 105 so that system controller and switch 101 can determine which of any of them should start communicating with mobile unit 105. In claim 3 as now amended, one or more of the other base stations send the PING command that elicits the ECHO response. There is neither a hint nor a suggestion in Farwell et al. '354, either alone or in combination with Grounds et al. '381, that a handoff could be initiated by neighboring base stations 103 and 102, or more generally that base station 102 and/or 103 should solicit communications from mobile unit 105 in order to measure the strength of the signals from mobile unit 105.

In addition, an inadvertent typographical error ("handset" instead of "mobile unit") in the preamble of claim 3 has been corrected.

With independent claim 3 allowable in its present form, it follows that claims 4, 5 and 12, that depend therefrom, also are allowable.

Objections

The Examiner has objected to claims 6-11 as being based on rejected base claims. The Examiner has noted that claims 6-11 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim.

In view of the discussion above in the context of the § 103(a) rejections, Applicant submits that the base claims from which claims 6-11 depend are allowable, making claims 6-11 allowable in their present form.